Historic, Archive Document

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ABANDONED MINES & RECLAMATION

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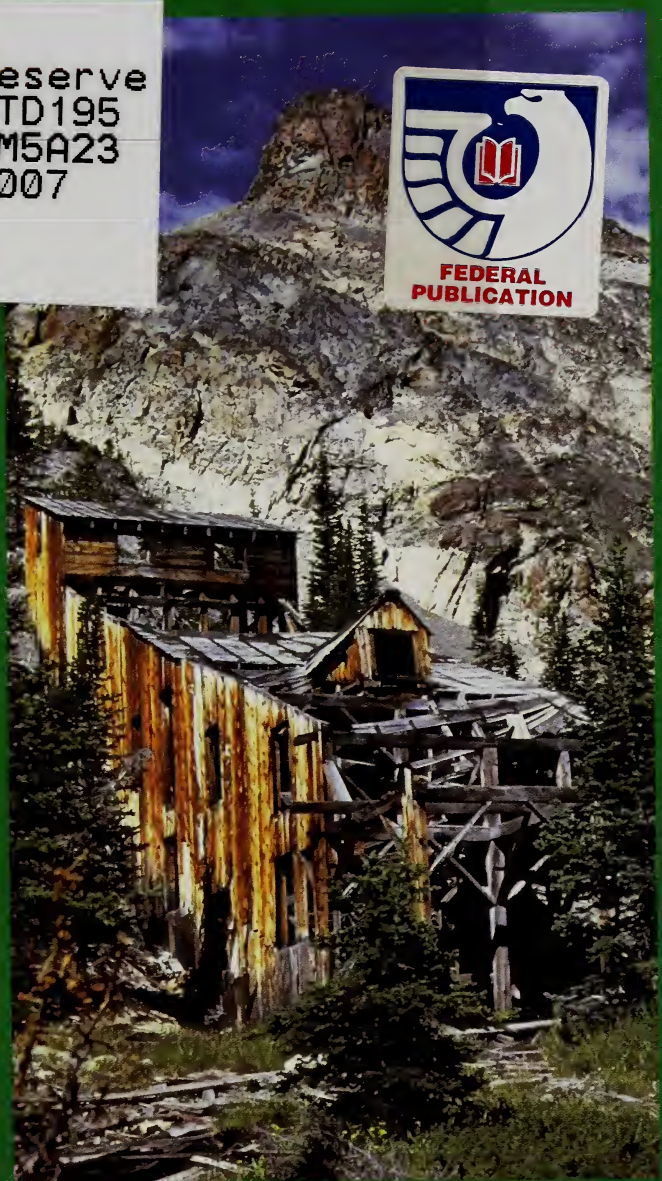


FEDERAL PUBLICATION

Forest Service

United States Department of Agriculture

HERITAGE, HAZARDS, AND HABITAT

Belmont Mine, Nevada

King of the West Mine, South Dakota

Abandoned mines on the national forests are a heritage of mixed blessings. Some mines are cultural resources—windows to an important and colorful chapter in American history.

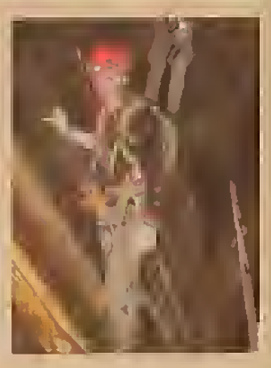
Others provide valuable habitat for many important species of wildlife, including bats.

Yet, many abandoned mines contain hazards that could be unsafe and lethal to humans. The Forest Service in its AML Program seeks to minimize the human health and safety hazards at abandoned mines, while preserving the historic and wildlife habitat resources the mines provide.

Because resources are limited, projects within the AML Program are prioritized based on the number and type of hazards present at the mine, accessibility of the mine to the public, and the cost to mitigate the hazards present. Some considerations for prioritizing sites include the following:

- Has a death, injury, or close call occurred at this site?
- Have complaints or concerns about this site been expressed?
- Does this site include developed recreation facilities or other facilities that attract concentrations of people?
- Is the site accessed by or close to forest roads or trails?
- Is the site in an area with a high concentration of abandoned mine sites?
- What are the severity of the hazard and the ease of accessibility for the public?

EMPLOYEE SAFETY



Forest Service Health and Safety Code FSM 6709.11, Section 22.81, in Part

A qualified Forest Service employee or State or Federal mine inspector must assess the safety of underground workings and accompany Forest Service employees when they enter an underground abandoned/inactive mine or deep cut.

A line officer must determine which noncertified employees have a need to go underground and ensure that they receive the required training in first aid; cardiopulmonary resuscitation, or CPR; and the use of personal protective equipment.

MINE CLOSURES AT REMOTE SITES

Remote sites can be hazardous because of their location to popular trails.

Copper Kopje Mine, Idaho

In some cases, helicopters can be used to place steel tubes to close open mine shafts in remote areas.

Pride of the West Mine, Colorado

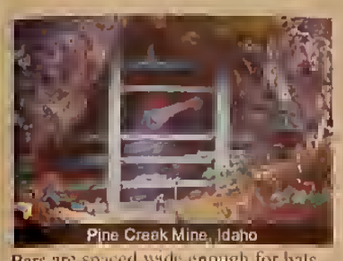
Helicopters can also be used in other ways to close shafts.

Garnet Dike Mine, California

In some cases, materials must be carried in on foot.

BAT-FRIENDLY CLOSURES

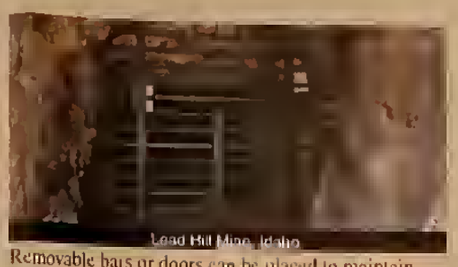
Wildlife surveys—part of the inventory and design process for underground mine closures—determine where significant habitat exists, so closures will be designed to allow wildlife continued entry to the mine and, at the same time, restrict entry to the public.


Pine Creek Mine, Idaho

Bars are spaced wide enough for bats and narrow enough to keep out children.

Silver Bo[illegible] Mine, Idaho

After vertical supports are anchored, horizontal bars are welded in place.


Lead Hill Mine, Idaho

Removable bars or doors can be placed to maintain access.

Capitol Silver Mine, Idaho

Capitol Silver Mine, Idaho

A culvert can be used to close unstable openings.

Bluebird Mine, Arizona

Blackjack Shaft, Idaho

Empire Copper Mine, Idaho

Empire Copper Mine, Idaho

Vertical shafts can be closed with cupolas to allow bats to fly in and prevent humans and wildlife from falling in.

COMPLETE MINE CLOSURES

W. Fork Moon Mine, Idaho

W. Fork Moon Mine, Idaho

W. Fork Moon Mine, Idaho

Where wildlife habitat is not an issue and where a mine is accessible by road, it can be feasible to backfill shafts with heavy equipment.

Waterline Mine, South Dakota

Waterline Mine, South Dakota

Ridge Runner Mine, South Dakota

Expanding foam products can be used to facilitate closure of adits and shafts, even in remote areas.

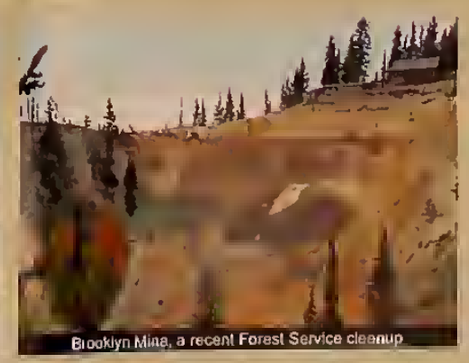
PARTNERSHIPS

The Forest Service works with many State, Federal, and private partners to mitigate safety hazards and clean up abandoned mines.

Monday Creek Watershed, Ohio. At last report, partners had invested approximately $5 million toward the cleanup of abandoned coal mines in the Monday Creek Watershed. The Forest Service has contributed a similar amount of work and funding.

Cottonwood Wash, Utah

Cottonwood Wash, Utah. The Forest Service worked with the State of Utah and the Bureau of Land Management to close hundreds of mine openings, remove thousands of cubic yards of radioactive tailings, and restore miles of abandoned mine roads.


Brooklyn Mine, a recent Forest Service cleanup

Animas Watershed, Colorado. The Animas is one of two watersheds identified by Congress in 1995 as pilot projects for abandoned mine cleanup. The Forest Service is working collaboratively with other members of the Animas River Watershed Group to assess and clean up the worst sources of pollution in the watershed.

Lutirell Repository, Montana

Boulder Watershed, Montana. The Boulder is the other pilot watershed designated by Congress in 1995 for abandoned mine cleanup. The Forest Service, working collaboratively with the Environmental Protection Agency, Bureau of Land Management, and the State of Montana, has cleaned up a number of mines, including the Buckeye, Enterprise, Bullion, and Daily West.

Pacific Mine Mill Tailings, Utah, before cleanup

American Fork Canyon, Utah. The Forest Service completed cleanup of abandoned mines on the National Forest System lands in this drainage area in 2003. In 2004, Trout Unlimited initiated a Good Samaritan Cleanup together with the Environmental Protection Agency, Snowbird Resort, and Tiffany & Co.

Pacific Mine Mill Tailings, Utah, after cleanup

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EXAMPLES OF ABANDONED MINES AND RECLAMATION

Minnesota Mine, Colorado

Griffon Mine, Nevada

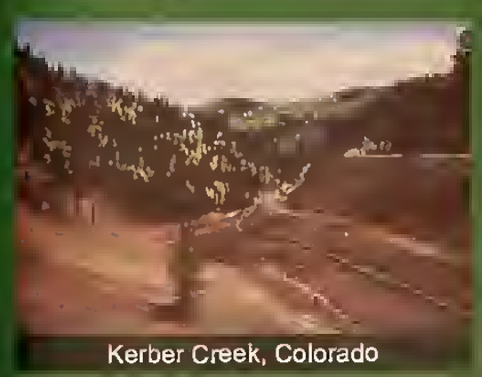
McCleur Mine, Arizona

Kerber Creek, Colorado

Minnesota Mine, Colorado

Griffon Mine, Nevada

McCleur Mine, Arizona


Kerber Creek, Colorado

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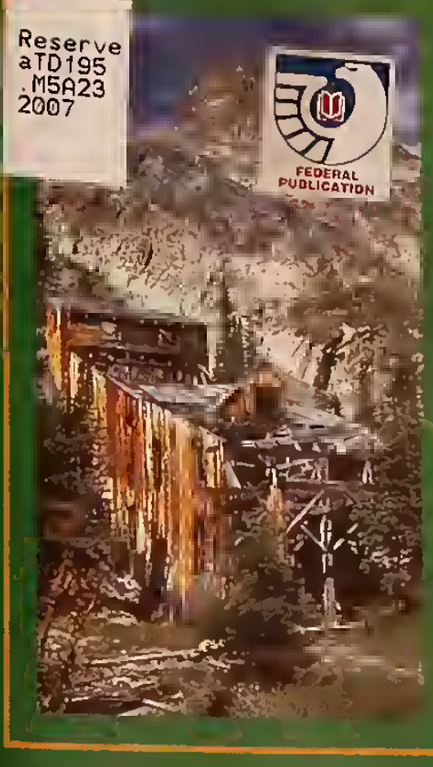
ABANDONED MINES & RECLAMATION



Forest Service

United States Department of Agriculture

Accomplishments since 1998:

2,000 safety hazards mitigated . . . 400 abandoned mines cleaned up . . . more than $200 million in contributed funds or work

THE LEGACY OF HISTORICAL MINING IN THE WEST

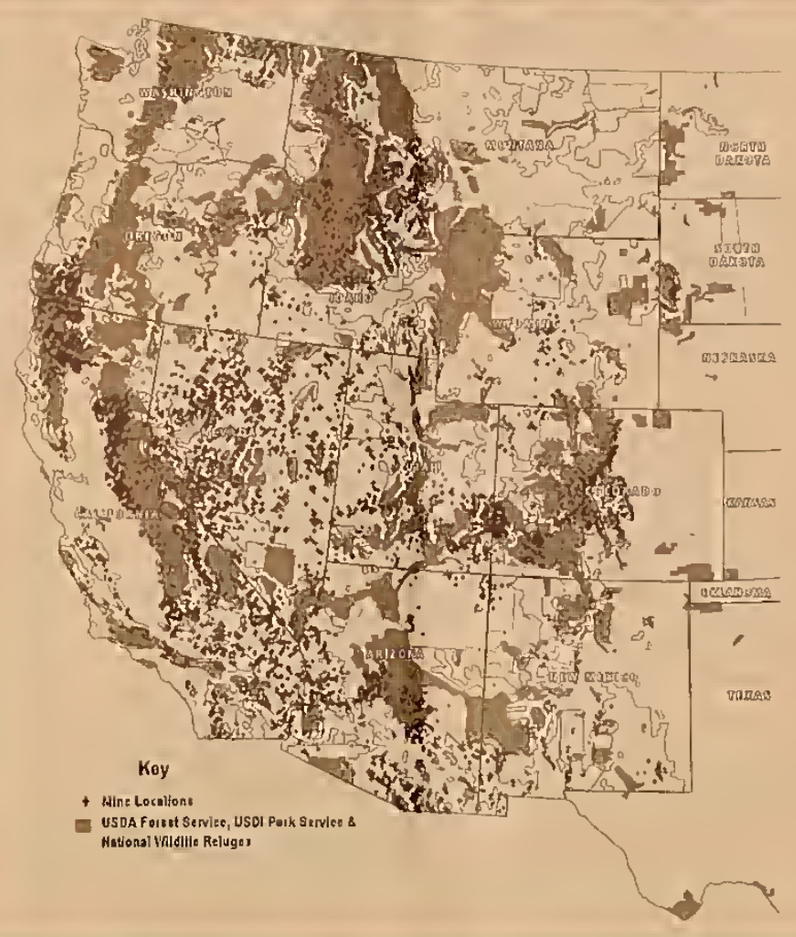
When gold was discovered at Sutter's Mill in 1849, farmers left their fields, merchants closed their shops, and soldiers left their posts to pursue their fortunes.

From 1848 to 1852, the nonnative population of California grew from 14,000 to 300,000. This story of transformation from sleepy outposts to bustling towns was to be repeated across the West. Miners populated the first wave of western settlement and provided the incentive for others to follow. When the mines played out, the roads, towns, and other infrastructure necessary to support the mines were abandoned in some cases; but, in others, they were left behind to be used by the farmers, ranchers, loggers, and others who followed.

The environmental impacts of mining—even 50 years ago—were not a serious concern, as they are today. Also, in earlier years, they were not regulated by State or Federal law. As a result, along with the legacy of wealth and development, the boom and bust of mineral development left behind hundreds of thousands of abandoned mines on private and public lands. Today, these abandoned mines are a valuable cultural resource to be preserved and, at the same time, a significant environmental problem for local watersheds and a hazard to public safety.

Atlanta, Idaho

Elmore Mine, Idaho

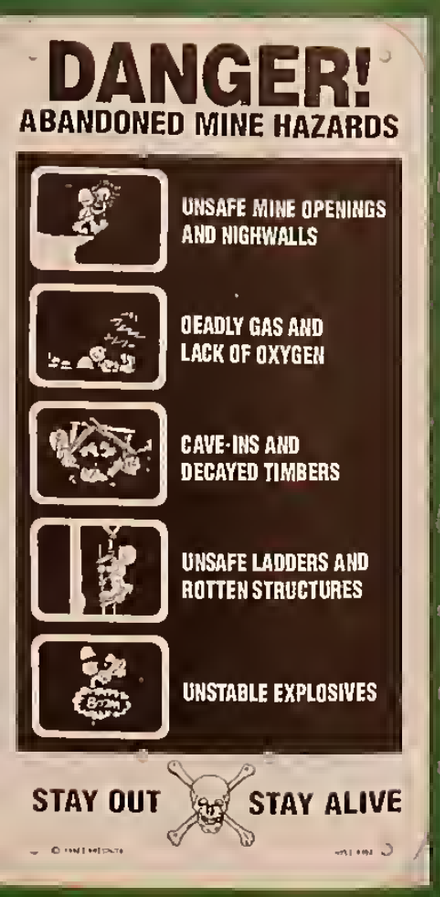


In 1995, the Forest Service, U.S. Department of Agriculture, using data compiled by the Bureau of Mines, estimated the following number of abandoned mines were inside national forest boundaries:

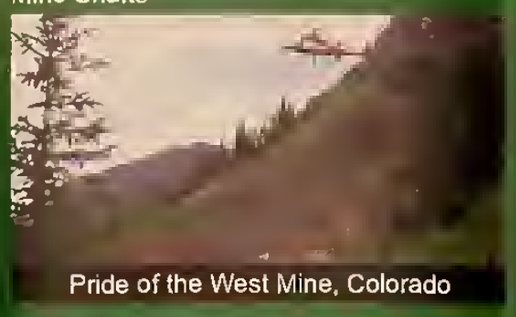
- 38,991 total abandoned mine sites.
- 13,597 (34%) surface or underground mines with records of mineral production (past producers), most of which involved minerals such as arsenic, cadmium, copper, lead, mercury, and zinc—minerals that pose a high risk of chemical contamination to the environment.
- 1,347 (3.5%) placer mines, which typically resulted in various levels of physical disturbance to stream channel, flood plain, and riparian environments.

In 1994, the Forest Service estimated that approximately 2,500 abandoned mines required cleanup of hazardous substances and that more than 22,500 mines would require mitigation of nonhazardous pollution and safety hazards at costs of $2.1 billion and $2.3 billion, respectively.

SOME ABANDONED MINE SAFETY HAZARDS ON THE NATIONAL FORESTS



Mine Shafts


Pride of the West Mine, Colorado

Hazardous Materials

Taylor Mine, Nevada

Flooded Mine Adits

Rawley Mine, Colorado

Explosives

Livingston Mine, Idaho

Unstable Slopes

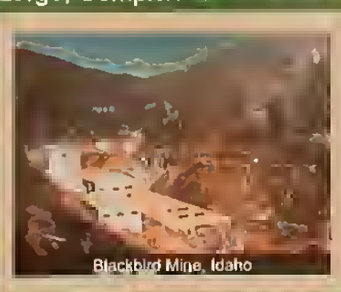
Brooklyn Mine, Colorado

Unsafe Structures

Livingston Mine, Idaho

TYPICAL ABANDONED MINE LANDS (AML) CLEANUP PROJECTS

Large, Complex Mines and Millsites


Blackbird Mine, Idaho

- **Size:** Tens to hundreds of acres.
- **Cleanup and Mitigation:** Mill buildings, roads, mine openings, open pits, waste rock, chemical reagents, tailings, and spent ore.
- **Cost:** Tens to hundreds of millions of dollars.
- **Time:** 5 to 10 years.
- **Benefit:** Tens to hundreds of acres of sensitive or critical habitat, soil, and vegetative resources restored.

Historic Placer Mining

Yankee Fork Dredge, Idaho

Historic placer mining disrupted miles of streams and flood plains. These areas may be contaminated with mercury and sediment and, in many cases, have lost aquatic habitat, flood plains, wetlands, and riparian areas. Restoration involves assessing mercury contamination, removing placer tailings, and designing and constructing a natural stream channel and flood plain.

Small Mine Cleanups and Safety Hazards

Midwest Mine, Colorado

Most abandoned coal and hardrock mines consist of isolated mine openings, waste piles, shafts, roads, and old structures. Although the mines are small, they often pose significant environmental problems for local watersheds and hazards to public safety. Cleanup may involve reshaping the site; closing mine adits and shafts; containing mine wastes in onsite capped and lined repositories; controlling water source and using simple treatment systems (e.g., passive lime); removing mine chemicals and trash; removing or stabilizing old mine buildings for historic interpretation; and preserving habitat, where possible, for AML-dependent wildlife species, such as bats.